Si PIN photodiode with preamp
S7516 series

Wide band detector for spatial light transmission

S7516 series is a Si PIN photodiode incorporating a wide band preamplifier chip, hermetically sealed in a TO-8 package. The photodiode has a large active area (ϕ3 mm) yet offers a wide bandwidth, making S7516 series suitable for spatial light transmission. A lens (ϕ9 mm) window type (S7516-01) is also available.

Features

- TO-8 style 5-pin package
  S7516 : flat glass window
  S7516-01: lens window
- Large active area
  S7516 : ϕ3 mm
  S7516-01: ϕ9 mm (lens)
- Wide bandwidth: fc=170 MHz (R_L=50 Ω)
  fc=200 MHz (R_L=500 Ω)

Applications

- Spatial light transmission, etc.

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Power supply (for Op amp)	Vcc	±6	V
Reverse voltage (for photodiode)	V_R	50	V
Operating temperature	Topr	-30 to +60	°C
Storage temperature	Tstg	-40 to +80	°C

■ Electrical and optical characteristics (Ta=25 °C, Vcc=±5 V, V_R=30 V)

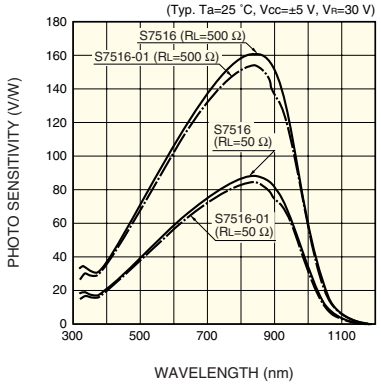
Parameter	Symbol	Condition	S7516			S7516-01			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		-	320 to 1060	-	-	320 to 1060	-	nm
Peak sensitivity wavelength	λp		-	840	-	-	840	-	nm
Photo sensitivity	S	λ=λp, R_L=50 Ω	-	88	-	-	84	-	V/W
		λ=λp, R_L=500 Ω	-	160	-	-	154	-	
Cut-off frequency	fc	-3 dB, R_L=50 Ω	140	170	-	140	170	-	MHz
		-3 dB, R_L=500 Ω	160	200	-	160	200	-	
Output noise voltage	Vn	Dark state, f=170 MHz, R_L=50 Ω	-	9	-	-	9	-	nV/Hz$^{1/2}$
		Dark state, f=200 MHz, R_L=500 Ω	-	15	-	-	15	-	
		Dark state, f=100 kHz~170 MHz, R_L=50 Ω	-	130	-	-	130	-	μVrms
		Dark state, f=100 kHz~200 MHz, R_L=500 Ω	-	240	-	-	240	-	
Noise equivalent power	NEP	f=170 MHz, R_L=50 Ω	-	0.16	-	-	0.16	-	nWrms/Hz$^{1/2}$
		f=200 MHz, R_L=500 Ω	-	0.13	-	-	0.13	-	
Power supply current	Is	Dark state	-	5	15	-	5	15	mA

Precautions for use

● ESD
S7516 series may be damaged or their performance may deteriorate by such factors as electro static discharge from the human body, surge voltages from measurement equipment, leakage voltages from soldering irons and packing materials, etc. As a countermeasure against electro static discharge, the device, operator, work place and measuring jigs must all be set at the same potential. The following precautions must be observed during use:
· To protect the device from electro static discharge which accumulate on the operator or the operator's clothes, use a wrist strap or similar tools to ground the operator's body via a high impedance resistor (1 MΩ).
· A semiconductive sheet (1 MΩ to 100 MΩ) should be laid on both the work table and the floor in the work area.
· When soldering, use an electrically grounded soldering iron with an isolation resistance of more than 10 MΩ.
· For containers and packing, use of a conductive material or aluminum foil is effective. When using an antistatic material, use one with a resistance of 0.1 MΩ/cm^2 to 1 GΩ/cm^2.
● Wiring
If electric current or voltage is applied in reverse polarity to an electronic device such as a preamplifier, this can degrade device performance or destroy the device. Always check the wiring and dimensional outline to avoid misconnection.

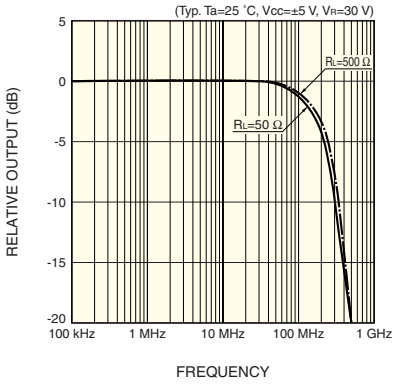
SOLID STATE DIVISION

■ Spectral response



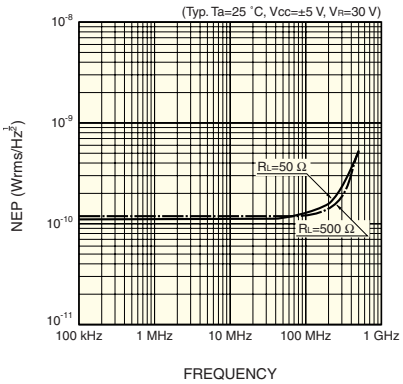
KPINB0201EB

■ Frequency response



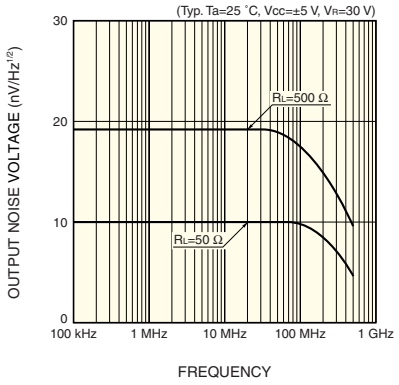
KPINB0127EB

■ NEP characteristics



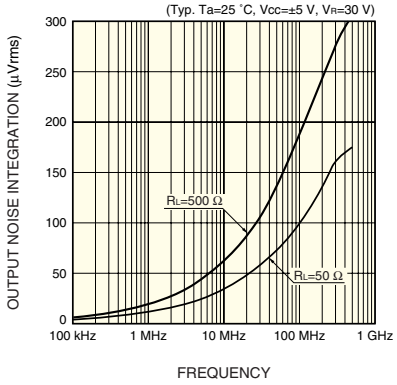
KPINB0119EC

■ Output noise voltage characteristics



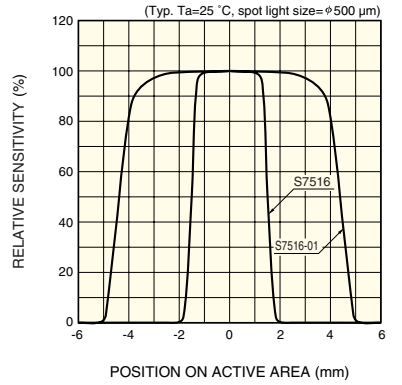
KPINB0120EC

■ Output noise integration characteristics



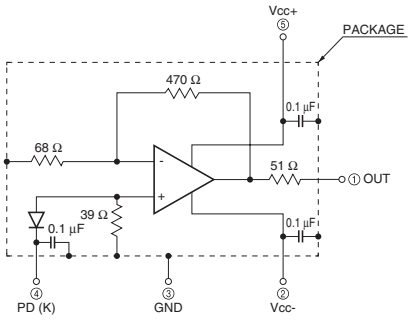
KPINB0202EA

■ Sensitivity uniformity



KPINB0237EA

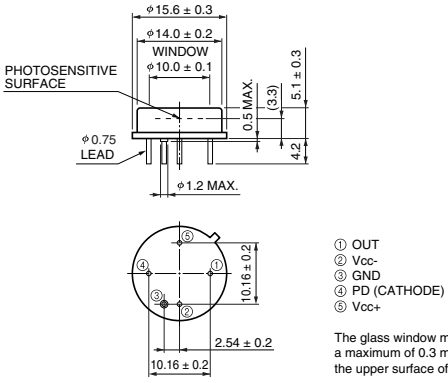
■ Equivalent circuit



KPINC0013EA

■ Dimensional outlines (unit: mm)

S7516

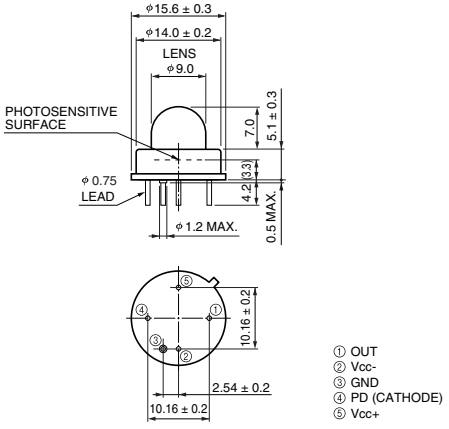


① OUT
② Vcc-
③ GND
④ PD (CATHODE)
⑤ Vcc+

The glass window may extend a maximum of 0.3 mm beyond the upper surface of the cap.

KPINA0057EA

S7516-01



① OUT
② Vcc-
③ GND
④ PD (CATHODE)
⑤ Vcc+

KPINA0064EA

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Hamamatsu City, 435-8558 Japan, Telephone: (81) 053-434-3311, Fax: (81) 053-434-5184, http://www.hamamatsu.com
U.S.A.: Hamamatsu Corporation: 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218
Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 08152-3750, Fax: (49) 08152-2658
France: Hamamatsu Photonics France S.A.R.L.: 8, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777
North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01
Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741

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